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## **The Complexity of the Assessment of Creative Climate and Group Creativity**

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**ABSTRACT** This paper provides a literature review that firstly demonstrates a growing interest in studies on creative climate and group creativity that is followed by a discussion on the important methodological significances of assessment of climate and the complexity of assessing group creativity. From the discussion, we suggest that the nature of the diversity of members of a group should be part of an assessment index. This contributes to future instrument development in assessment of group creativity.

**Keywords:** creative climate, group creativity, complexity, assessment

### **Instrument of Assessing Climate and Group Creativity**

In recent years, the literature demonstrates a growing interest in studies on creativity and group creativity (Ekvall, 1983; Ekvall & Arvonen, 1984; Ekvall et al., 1983, 1996; Sawyer, 2007). Among the various aspects of studies, the most prominent accomplishment is the development of various sophisticated tools to assess group creativity (Ekvall et al., 1983, 1996). Most of these tools have the assessment of group climate as their core function. Ekvall first developed an instrument to measure group creativity (Ekvall, 1983; Ekvall & Arvonen, 1984; Ekvall et al., 1983, 1996). In 1980, he developed the Creative Climate Questionnaire (CCQ). Through factor analysis, CCQ has produced 10 creative climate dimensions (Ekvall, 1983) including challenge, freedom, risk taking, debates, idea support, conflicts, humor (playfulness), liveliness, idea time, and trust/openness. Laurer (1994) further developed the CCQ to provide some new conceptual bases and was revised as the Climate for Innovation Questionnaire.

Sackmann (1992) noted that organisations at different levels have different sub-cultures, some of which maybe changed by the overall organizational environment. Gersick (1988) found that different groups in an organisation may experience com-

pletely different work environments. However, Amabile (1987) she advocated using the assessment of the work environment to forecast creative activity; the assessment of the work environment is realised by people's perceptions of the environment or, to be exact, the work environment for creativity. She suggests that the components fall into two general categories: "stimulants to creativity" and "obstacles to creativity". She views the one positively related to creativity as the important mechanism of group creation. Amabile (1987) designed an instrument to assess the environmental climate, based on the conceptual model that was previously called the "work environment inventory" (WEI) and afterwards revised as "assessing the climate for creativity" (namely KEYS).

Isaksen, Lauer & Ekvall (1999) from the Creative Problem Solving Institute at Buffalo University developed an instrument to assess organisational climate for creativity, the Situation Outlook Questionnaire (SOQ), on the basis of a Model for Organizational Change. Ekvall participated in the revision and tested the instrument's reliability and validity using statistics from 1111 samples. The results support both the reliability and validity. The SOQ was developed, which involved assessing nine aspects, namely, challenge/intervention, risk taking, debates, idea support, conflicts, game loving/humour sense, idea time, trust and openness, and freedom. Isaksen et al. (2000-2001) spent 15 years working on the scale that incorporates Ekvall's early scale and the work done by the Research Centre, concerning the tests on reliability and factor structure of the Creative Climate Questionnaire and concerning the exploratory proof of the relationship between cognitive style and perception of creative climate (Isaksen, et. Al. 2000, 2001).

British scholars Anderson and West (1998) developed the Team Climate Inventory (TCI) as an assessment scale suitable at the group level. A proximal work group was defined as either the permanent or semi-permanent team to which individuals are assigned, whom they interact with regularly in order to perform work-related tasks. The early version of the TCI comprised 61 items; the present 38-item scale was developed in 1994, and is available in several languages, including Swedish and Finnish, and is widely used in research across Europe.

Mathisen and Einarsen (2004) performed a detailed analysis and comparison of the TCI for assessing innovative environments within organisations. In addition, the Siegel Scale of Support for Innovation (SSSI) was designed by the American scholars Siegel and Kaemmerer (1978) for the supposedly existing organisational climate in an innovative organisation. The SSSI consists of 61 items and 5 subscales: 1) leadership supporting innovation; 2) autonomy in work; 3) norms encouraging diversity; 4) sustainable development; and 5) consistency of work processes and results.

It is difficult to determine whether the above-mentioned scales, all of which were designed by scholars from different countries are suitable for conditions in a particular context or not, for example, Mainland China; no such scales have been developed in this country. Although the CCQ was adapted by Professor Wu and his colleagues in Taiwan in 2004, it is necessary to design the scale assessing group creative climates for use in Mainland China, due to the differences of regional culture between the two areas. In particular, future research should deepen the understanding of how the work environment interacts with other factors in influencing creativity and innovation within

work groups and organisations so that investigation can be directed to the most appropriate areas. This further indicates the necessity of discussing the complexity of assessment of group creativity in this paper.

### **Significance and Changes of Assessing Creativity Climate**

The climate of creativity is of greater importance than other factors (such as ability) to group creativity. Creativity is a factor that a group can directly control. Woodman, Sawyer and Griffin (1993) suggest that individual creativity is a function of antecedent conditions, for example, cognitive style and ability, personality factors, relevant knowledge, motivation, social influences, contextual influences, and so on. The steadily in individuals, impossibly changeable and called something of the past formation. It is impossible for managers to influence cognitive style and ability, or personality factors that group members have formed in the past, but it is possible for them to influence group members' motivation and relevant knowledge and provide group members with different backgrounds and environments.

One of the problems existing in prior research on the assessment of creativity is to make a people-made separation of man from the environment, so that it is impossible to test creative behaviours accurately. There has been a change in the assessment of creativity in recent years, that is, a change from the assessment of subjects to that of the environment, concentrating on the conditions under which qualified personnel come into being and develop and how their creative potentials develop into reality, by means of the assessment of the psychological climate and environmental conditions.

Therefore, this paper emphasizes to assess the subjects within their environment and instead of the assessment of "what creativity is" to that of "where creativity comes from"; from the assessment of psychological features developed by subjects in the past to that of the environment in which the subject work; from the assessment results in simulated situations (the test of creativity, such as TTCT) to those carried out in the real situation. Furthermore, this paper suggests the following tendency characteristics and methodological meanings:

First of all, the research method has changed. The discussion of where creativity lies can be answered in that it appears in the climate which promotes its birth. The change of research route has been very important in that it has brought about a new methodology, namely authentic proof that obtains information from authentic situations, different from scientism. Environmental psychologist Barker (1978) depicted this in terms of giving up the "operator" function of traditional psychologists (controlling the experiment and obtaining the experimental result) and choosing their "sensor" function, observing and interpreting the authentic environment and activity. The dominant method to test creativity is to simulate authentic and creative situations, tightly controlling the stimulant condition (the introductory words, timing and stimulant factors), requiring the respondents to answer questionnaires there and then. These contrived conditions may not accurately reflect the creator's creative processes, depriving the creator of the opportunity to consider the problems and demonstrate intuition and inspiration. The authentic situation in which the creator stays is also taken away so that he/she has no

way to obtain information and communicate with others. Creative activities often happen in authentic situations.

Second, the nature of the focus upon the assessed subject has also been changed. The assessment of subjects focuses on distinguishing their qualities, which represent the measurement of capable people and meets the requirements of people-development. The assessment of environment focuses on the conditions under which a human's capability grow up, taking the group climate and conditions of environment as the determining elements influencing whether people's potential creativity can be maximised, namely, how the creative potentials can be operationalised. As far as developing creative personnel is concerned, the assessment of the environment may be of more significance. Studies have shown that every person has creative potential; how to create a suitable cultural climate for this potential to be realised is well worth studying, perhaps more than other problems such as who has greater creativity. However, previous studies have not distinguished between the climate of large organisations and small teams or how individuals perceive the climate. In this sense, this present study has attempted to redress these shortcomings. Future studies may perhaps analyse the degree to which the climate directly related to individual feelings impacts on individual creativity, and whether the climate of small groups has the greatest impact on group creativity. Future studies may address the question of whether the levels of effect of the three climate factors on individual and group creativity can be distinguished, in order to make the scientific management more effective.

### **The complexity of assessing group creativity**

#### *The components of a group*

We suggest that the climate by itself is not enough to assess group creativity even though it is important in the assessment. In assessing group creativity, another three dimensions should be considered: the components of a group; the task quality of a project undertaken by the group and the work basis of a group. The second dimension means that the achievement in the group.

Diversity in the group's components is very important to its creativity. Milliken et al. (1996) showed that diversity in the group's components affected its creativity process as well as its achievements. They wrote that the group members who come to understand the value that diversity plays in the group's cognitive processes are likely to experience more positive affective reactions to their group during the later stages of the group's life. In fact, differences that were initially seen as problematic may become a source of distinctiveness and pride.

Further to the suggestions made by Milliken et al. (1996), we also considered the known age, sex and disciplines as relevant elements of group structure, and diversity of cognitive style as deep and implicit elements of group structure.

To explore diversity, we begin with cognitive style. The designed cognitive style scale includes 9 dimensions: 1) acuteness-slowness, 2) broadness-depth, 2) whole-detail, 4) divergence-convergence, 5) ideal-reality, 6) steadiness-excitedness, 7) introversion-extroversion, 8) independence-dependence, and 9) risk taking-prudence. Each

dimension has 5 items, totalling 45 items (Fu & Luo, 2005). Many factors have been suggested as relating to cognitive style and it is too difficult to assess the differences of group cognitive style. Probably the lesson we can draw from this failure is to consider whether we should have focused on one or two of the most important cognitive styles affecting the creative solutions of problems. Kirton & Manual (1999), for instance, concentrated on a single cognitive style only: the dimension of adaption---innovation. At present, the research on polar balance of cognitive style has proceeded to the stage of empirical analysis and description, just as our project team has done in our trial research and up until now the feature value has not been obtained from the statistics to measure the balance of the structure. In our future research we intend to identify the component factor that can bring about the biggest probability of implicit component factor change. Therefore, the conclusion is drawn that the attention to an explicit component can result in diversity of cognitive style, and in return, cognitive style can improve creative processes and methods. It is necessary to make clear the relationship between explicit and implicit components, and the relationship between diversity and organism in a group.

For instance, in one of previous studies (Fu & Luo, 2005), the subjects were divided into groups by gender and then analysed by means of ANOVA. The conclusion is that males and females were different in some dimensions of cognitive style such as acuteness of perception, steadiness of mood and risk taking. Consequently, mixed gender groups will have a greater probability of diversity of cognitive style. Partners comprising a female and a male will have a higher probability of compensation than same gender partnerships in acuteness of perception, steadiness of mood and risk taking. As to whether partners made up of people with different disciplines will be favourable to the compensation for cognitive style, the research findings achieved by many researchers serve as a definite "yes" answer. Ekvall (1996) argued that four types of factors in the organisational climate had an important impact on creative activity as follows: ① mutual trust and confidence; ② challenge and motivation; ③ freedom to seek information and show initiative; ④ pluralism in views, knowledge and experience and exchange of opinions and ideas. Regarding the last point, Ekvall (1996) also notes that diversity of members is important for group creativity. Accordingly, the key issue is how to diversify the group's components as a dimension when assessing the group creative climate.

#### *Work basis and exploration of task*

It is believed that the assessment of group climate can not simply replace that of group creativity. Knowledge structure of a subject and prior achievements lay a foundation for creative problem solving. Amabile (1983) argues that, according to the conceptual definition of creativity, products or answers can be said to be creative only when they satisfy the following requirements: (A) a task should have both novelty and suitability as the instant response to it, and (B) a task should be exploratory, not procedural. The TCI model was based on West's theory (1990), containing 4 main factors of work group innovation: 1) vision; 2) participative safety; 3) task orientation; and 4) support

for innovation. West (1990) also emphasised that regarding to the “task orientation”, the task should be considered in relation to creativity.

Generally speaking, well-based groups, having already occupied the forward position of the research field, have more opportunities to make a breakthrough. However, some of the little-known groups based on nothing, have also made creative achievements. But as far as groups are concerned, it is necessary to consider their work basis.

## **Conclusions**

People’s creativity is so complex a phenomenon that it is too simple to treat it by using a single score or index. Treffinger (1980) pointed out that the so-called quick and clear creative index used to do research may break the research clue in the educational field. Therefore, we should not only take the assessment of individual creativity seriously, but also that of group creativity. Therefore, we suggest that the nature of the diversity of members of a group should be part of an assessment index. We have discussed our attempt at assessing group construction by examining the group members’ cognitive styles, but have not produced a satisfactory result. Secondly, the characteristics of the group tasks should be considered. Then, the participants’ prior knowledge and creative accomplishments have established the foundation of subjects’ creativity.

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